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PRINCIPAL SOIL ASSOCIATION AREAS OF ILLINOIS

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PRINCIPAL SOIL ASSOCIATION AREAS OF ILLINOIS

The broad soil regions in Illinois are shown on the accompanying soil association map. The general characteristics and major management problems of each soil association are described in the following paragraphs. More specific information on local soil conditions may be obtained from detailed soil maps and soil-type descriptions. The relationships between the soil types which make up the soil associations, their topography and slope, surface color, degree of sub-soil development, and parent material are indicated in Table 1. In Table 2 the soil associations are grouped according to texture and permeability of the subsoil and color of surface soil.

Nearly 300 different soil types have been mapped to date in Illinois. Different soils are formed as a result of differences in climate, vegetation, topography and drainage, parent materials, and the length of time through which the weathering forces have been acting.

As soon as soil parent material is exposed at the earth's surface, natural weathering processes and soil development begin. During the soil-forming process, layers or horizons develop that roughly parallel the earth's surface. A vertical section through these layers or horizons is called a soil profile. Soils are differentiated on the basis of the characteristics and arrangement of all horizons in the profile. Soils having similar profile characteristics and developed from similar parent material are members of the same soil series. Soil series are given geographic names, such as "Ridgeville" series or "Muscatine" series. Variations in the texture of the surface soil are allowed within a soil series. A soil type is a member of a soil series which has a specific texture of surface soil. Soil types are named by combining the series name and the textural designation of the surface soil; for example, Ridgeville fine sandy loam or Ridgeville sandy loam.^{1/} In Illinois soil types are also given numbers for convenience.

Area A - This association is limited to Kane, McHenry, and adjacent counties in northeastern Illinois. The topography is undulating to strongly rolling with frequent "knob and kettle" terrain. Both erosion and drainage problems on such terrain are often difficult to solve. This area is composed of dark-colored prairie soils with subsoils that are medium to coarse in texture and moderately rapid in permeability. The underlying material is sandy to gravelly, calcareous glacial till. The soils are drouthy where this coarse material occurs near the surface. Where not drouthy, these soils are medium to highly productive.^{2/}

^{1/} In Illinois the "descriptive" system of naming soil types was used prior to 1933. With this system of nomenclature, the color and texture of the surface soil were included in the soil-type name; for example, Brown Silt Loam. When such material as sand, gravel, or rock occurred at a depth of less than 30 inches, the fact was indicated by the word "On," and when its depth exceeded 30 inches, by the word "Over"; for example, Brown Silt Loam On Gravel and Brown Silt Loam Over Gravel.

^{2/} Productivity, as used throughout this discussion, refers to the ability of soils to produce crops under a system where good management practices are followed. Good management includes the timely use of adapted cultural practices, careful handling of manure, the application of limestone, phosphate, and potash where needed in amounts as indicated by soil tests, and the use of a crop rotation which minimizes erosion and includes a legume or legume-grass sod as frequently as necessary to maintain an adequate supply of nitrogen and good soil tilth.

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Area B - This association also occurs in northeastern Illinois. Very irregular "knob and kettle" topography is common in this area. The soils in this area differ from those in Area A in that they developed under timber vegetation and have a light-colored surface. The subsoils are medium to coarse-textured and are moderately rapidly to rapidly permeable to water. The underlying soil parent materials in Area A and Area B are similar. The productivity of the soils in Area B varies from medium to low depending upon the depth to the coarse material, degree of drouthiness, and topography. Soil fertility^{1/} and erosion are major problems in cultivated areas.

Area C - This association consists of many nearly level to moderately sloping areas scattered throughout northeastern Illinois. Dark-colored prairie soils with medium-textured, moderately permeable subsoils predominate in these areas and tile drains can be used effectively. These soils range from high to very high in productivity and are among the best in Illinois. Limited areas of less productive sandy soils are also included in this association. These sandy areas are often drouthy, low in fertility, and subject to wind erosion.

Area D - The soils included in this association occur in northeastern Illinois, often in areas too small to show on the Soil Association Map. They occur to a limited extent in Areas C and I as well as in Area D. These soils developed on gently sloping to steep topography under timber vegetation and are light colored. Their subsoils are medium-textured and moderately permeable to water and to plant roots. The tillable land in these areas is medium to low in productivity. Fertility and erosion are the major problems on these soils.

Area E - This association occurs extensively in northeastern Illinois, predominantly on nearly level to moderately sloping topography. The soils are dark-colored and have subsoils that are fine-textured and moderately slowly permeable to water. Runoff is high and erosion is a problem, even on gentle slopes. Movement of water to tile is rather slow in these soils and the laterals should be placed moderately close together to obtain satisfactory drainage on level areas. These soils are medium to highly productive.

Area F - The soils in northeastern Illinois developed from fine to very fine-textured glacial till under timber vegetation are included in Area F. The topography varies from nearly level to strongly rolling. The steeper areas are unsuited for cultivation. The surface soils are light-colored and the silty clay to heavy clay subsoils are slowly to very slowly permeable to water. These soils are low in productivity. Erosion, drainage, and fertility are major problems in these areas.

Area G - Two groups of soils, Swygert-Bryce and Clarence-Rowe, occur extensively in this soil association area in northeastern Illinois. The topography in this area is generally nearly level to moderately sloping. Both the Swygert-Bryce group and the Clarence-Rowe group developed under prairie vegetation and have dark-colored surface soils. Swygert and Bryce have clay subsoils and silty clay substrata that are slowly permeable to water and plant roots. The Clarence-Rowe group has heavy clay subsoils that are very slowly permeable to water. Tile do not function satisfactorily in either group, making it necessary to depend primarily on surface drainage. Erosion on the sloping areas is a major problem.

^{1/} Fertility as used here refers to the ability of an untreated soil to supply to growing plants the proper amounts of chemical nutrients in readily available form.

SOIL ASSOCIATION MAP OF ILLINOIS

LEGEND

- A** DARK-COLORED, MODERATELY RAPIDLY PERMEABLE SOILS DEVELOPED FROM THIN LOESS ON CALCAREOUS COARSE TILL
- B** LIGHT-COLORED, MODERATELY RAPIDLY PERMEABLE SOILS DEVELOPED FROM THIN LOESS ON CALCAREOUS COARSE TILL
- C** DARK-COLORED, MODERATELY PERMEABLE SOILS DEVELOPED FROM THIN LOESS ON CALCAREOUS LOAM TILL
- D** LIGHT-COLORED, MODERATELY PERMEABLE SOILS DEVELOPED FROM THIN LOESS ON CALCAREOUS LOAM TILL
- E** DARK-COLORED, MODERATELY SLOWLY PERMEABLE SOILS DEVELOPED FROM THIN LOESS ON CALCAREOUS SILTY CLAY LOAM TILL
- F** LIGHT-COLORED, SLOWLY TO VERY SLOWLY PERMEABLE SOILS DEVELOPED FROM CALCAREOUS SILTY CLAY LOAM TO CLAY DRIFT
- G** DARK-COLORED, SLOWLY TO VERY SLOWLY PERMEABLE SOILS DEVELOPED FROM THIN LOESS ON CALCAREOUS SILTY CLAY TO CLAY DRIFT
- H** DARK-COLORED, MODERATELY PERMEABLE SOILS DEVELOPED FROM MODERATELY THICK LOESS OVER CALCAREOUS LOAM TILL
- I** LIGHT-COLORED, MODERATELY PERMEABLE SOILS DEVELOPED FROM MODERATELY THICK TO THIN LOESS ON LOAM TILL
- J** LIGHT-COLORED, MODERATELY PERMEABLE SOILS DEVELOPED FROM THICK LOESS
- K** DARK-COLORED, MODERATELY PERMEABLE SOILS DEVELOPED FROM THICK TO MODERATELY THICK LOESS
- L** LIGHT-COLORED, MODERATELY SLOWLY PERMEABLE SOILS DEVELOPED FROM MODERATELY THICK LOESS
- M** MEDIUM TO DARK-COLORED, MODERATELY SLOWLY PERMEABLE SOILS DEVELOPED FROM MODERATELY THICK LOESS OVER WEATHERED DRIFT
- N** MEDIUM-COLORED, SLOWLY PERMEABLE SOILS DEVELOPED FROM THIN LOESS ON WEATHERED DRIFT
- O** LIGHT-COLORED, VERY SLOWLY PERMEABLE SOILS DEVELOPED FROM THIN LOESS ON WEATHERED DRIFT
- P** MEDIUM TO LIGHT-COLORED, VERY SLOWLY PERMEABLE SOILS DEVELOPED FROM THIN LOESS ON WEATHERED DRIFT
- Q** LIGHT-COLORED, MODERATELY SLOWLY PERMEABLE SOILS DEVELOPED FROM THICK TO MODERATELY THICK LOESS
- R** PREDOMINANTLY DARK-COLORED, MODERATELY PERMEABLE SOILS DEVELOPED FROM MEDIUM TO FINE-TEXTURED WATER DEPOSITS
- S** LIGHT AND DARK-COLORED, MODERATELY RAPIDLY PERMEABLE SOILS DEVELOPED FROM SANDY PARENT MATERIALS
- T** LIGHT-COLORED, MODERATELY PERMEABLE SOILS DEVELOPED FROM THICK TO THIN LOESS OVER BEDROCK
- U** LIGHT AND DARK-COLORED, MODERATELY SLOWLY TO RAPIDLY PERMEABLE SOILS DEVELOPED FROM THIN LOESS OR DRIFT ON BEDROCK
- V** DARK-COLORED, MODERATELY SLOWLY PERMEABLE SOILS DEVELOPED FROM MODERATELY THICK LOESS OVER CALCAREOUS FINE-TEXTURED TILL
- W** LIGHT-COLORED, SLOWLY PERMEABLE SOILS DEVELOPED FROM MODERATELY THICK LOESS OVER WEATHERED DRIFT
- X** LIGHT-COLORED, SLOWLY PERMEABLE SOILS DEVELOPED FROM MODERATELY THICK TO THIN LOESS ON BEDROCK
- Y** PREDOMINANTLY DARK-COLORED, NEARLY NEUTRAL, BOTTOM SOILS
- Z** PREDOMINANTLY LIGHT-COLORED, ACID, BOTTOM AND TERRACE SOILS

0 1 2 SCALE IN MILES

TABLE 1 - CONCLUDED

Area on Soil Assoc. Map	Major Soil Types (1) (Name and Number)							Minor Soil Types(2) (Number)	Surface Color	Subsoil Development(3)	Dominant Parent Material
	Topography and Slope (Percent)					Steep 15 + %					
	Depressional- Nearly Level 0 to 0.5%	Very Gently Sloping 0.5 to 1.5%	Gently Sloping 1.5 to 3.5%	Moderately Sloping 3.5 to 7%	Strongly Sloping 7 to 15%	Stokey 216	Stokey 216				
Q											
39											
40											
41											
42											
43											
44											
45											
R(4)											
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*Types which are often associated in the field but not developed from the dominant parent material.

(1) Many soils occur on greater slope range than shown.

(2) Surface color, subsoil development, and dominant parent material do not always apply to associated minor types.

(3) Subsoil development applies mostly to major types on 0, 5 to 7% slopes where those types are shown.

(4) Small areas of stream terrace soils are included on the map with bluffs and bottomland soils in Y.

Table 2.--Grouping of Soil Associations According to Texture and Permeability of Subsoil and Color of Surface Soil

Texture and permeability of subsoil	Color of surface soil	
	Predominantly light (Much of land nontillable)	Medium to dark (Nearly all land tillable)
Coarse texture, moderately rapid to rapid permeability	B,S Productivity:Low to medium	A,S Productivity:Medium to high
Medium texture, moderate permeability	D,I,J,T Productivity:Medium	C,H,K,R Productivity:High to very high
Fine texture, moderately slow permeability	L,Q,U Productivity:Low to medium	E,M,V Productivity:Medium to high
Very fine texture, slow to very slow permeability	F,O,W,X Productivity:Very low to low	G,N,P Productivity:Low to medium
Variable textured, stratified alluvium	Z Productivity:Low to medium	Y Productivity:High

The loss of the thin silty covering that blankets the underlying slowly permeable tills permanently reduces the productivity of those soils. Where uneroded these soils are moderately productive, the Clarence-Rowe group being less productive than the Swygert-Bryce.

Area H - The soils included in this association occur extensively in east-central Illinois and in limited areas in north-central Illinois. Dark-colored prairie soils with medium-textured, moderately permeable subsoils predominate in this area. The topography is generally nearly level to gently sloping. On these slopes the soils are developed from silty wind-blown loess and are among the most productive soils in Illinois. Drainage and the maintenance of good physical condition are the major soil management problems on such soils. In limited areas where strongly sloping topography occurs the soils developed from permeable glacial till rather than from loess. The soils on strongly sloping areas are more subject to erosion and are less productive than those which occur on gentle slopes.

Area I - This association occurs in northeastern Illinois, particularly in Boone county, and along streams and on some glacial moraines in east-central Illinois. The topography is dominantly moderately sloping to steep, but some nearly level areas are included. The soils on the gentler slopes were developed from loess and, on steeper slopes where the silty covering is absent, from glacial till. Light-colored, medium-textured soils with moderately permeable subsoils predominate. The tillable soils are medium-productive under good management. Fertility and erosion are the major problems on these soils.

Area J - This association is limited to the timbered areas along Illinois and Mississippi rivers in western and northwestern Illinois. Moderately sloping to steep topography prevails but gentler slopes are also included. The soils have light-colored surfaces and medium-textured, moderately permeable subsoils, except along the immediate bluff area where the soil material is coarser textured and

moderately rapidly permeable. They are responsive to management and medium-productive if well handled. The major soil management problem is the control of erosion.

Area K - The loess-derived, dark-colored prairie soils in west-central and northwestern Illinois are included in this soil association. The topography is generally nearly level to moderately sloping in west-central Illinois and somewhat more rolling in northwestern Illinois. The soils are medium-textured with moderately permeable subsoils and underdrain well. The silt loams and silty clay loams are very highly to highly productive and include some of the best soils in Illinois. Erosion is less active and less harmful in this area than in some areas, however its control should not be neglected. Sandy soils occur to a limited extent in this area. North and northwest of Lee county bedrock sometimes occurs at shallow depths, especially on slopes. Where the soils are sandy or shallow they are often drouthy and less productive.

Area L - The soils included in this association occur extensively along streams in western Illinois and in limited areas in northwestern Illinois. Topography varies from steep to nearly level but the less sloping areas are not extensive. The soils developed under timber vegetation and are light-colored. The subsoils are generally fine-textured and moderately slowly permeable to water. Rock outcrops are found on the steeper slopes northwest of Lee county. Drouthiness is a problem where the bedrock approaches the surface. The tillable land is low to medium in productivity. Fertility and erosion are major problems in this area.

Area M - This association is confined to nearly level and gently sloping areas in southwestern and western Illinois where the soils developed under grass vegetation. The surface soils are moderately dark-colored and the subsoils are fine-textured and moderately slowly or slowly permeable to water. Drainage by tile is slow but generally satisfactory if the laterals are spaced moderately close together. Most of these soils are medium-productive. Scattered throughout the area are "gray spots" which are less productive and less permeable than surrounding soils. Drainage and fertility are major problems on the soils in this area.

Area N - The soils included in this association occupy nearly level to gently sloping areas in south-central and southwestern Illinois. Although the soils developed under grass vegetation, they are highly weathered and have medium to light-colored surface horizons. The subsoils are very fine-textured and slowly to very slowly permeable. Tile drains do not function satisfactorily and open ditches are used for drainage. Most of these soils are moderately low in productivity. "Slick spots," which are scattered throughout this area, are very low in productivity. The major soil management problems on these soils are concerned with drainage and fertility.

Area O - This association occupies a large area in southern Illinois which originally supported a timber vegetation. The topography varies from nearly level to steep. Southeast of a line across the state from Monroe county through Lawrence county the topography is more rolling and bedrock is closer to the surface. The soils are light-colored and have very fine-textured, very slowly permeable subsoils. They are very low in productivity unless well managed. Some of the less sloping soils are used for agriculture, but the more sloping areas are adapted only to pasture or timber. Fertility and erosion are major problems on cultivated areas. These soils are generally deficient in lime, nitrogen, phosphorus, and potassium. Drainage is needed by surface ditches on nearly level areas.

Area P - The "gray prairie" area in southern Illinois which occupies nearly level to gently sloping topography comprises Area P. Most of the soils are light-colored and have very fine-textured, very slowly permeable subsoils. Numerous "slick spots" occur in the area. Drainage must be provided by surface ditches. These soils are low in productivity. They are generally deficient in lime, nitrogen, potassium, and phosphorus.

Area Q - The soils included in this association are developed from deep loess deposits adjacent to the Mississippi, Ohio, and Wabash river bottoms in the southern one-half of Illinois. The topography is predominantly moderately sloping to steep. Areas with numerous sink holes are present in southwestern St. Clair, Monroe, south-central Union, northwestern Pulaski, and southern Hardin counties. The soils have light-colored surfaces and medium to fine-textured subsoils that are moderate to moderately slow in permeability. The tillable land is low to medium in productivity. Increasing the organic matter and nitrogen supply in these soils, correction of their acidity and phosphate deficiency, and the control of erosion are the major soil management problems. Because of the steep topography in much of this association, many areas are best adapted for permanent pasture or timber.

Area R - This association includes many scattered areas in northeastern Illinois and along the major streams in other parts of the state where the soils developed from medium to fine-textured glacial outwash and terrace deposits of Wisconsin age. The topography is generally nearly level to gently sloping. Dark-colored silt loam and silty clay loam soils predominate but some sandy areas and some light-colored timber soils are also included in this association. The subsoils are normally moderately permeable and tile drainage is satisfactory if outlets are available. Drainage and the maintenance of a desirable physical condition are the major soil problems in these areas. The dark-colored soils are highly to very highly productive and the light-colored soils are moderately productive.

Area S - The sandy loam to sand soils developed from glacial outwash, terrace, and wind-sorted materials comprise this association. Limited areas of R, too small to show on the Soil Association Map, occur with these sandy soils. The topography in Area S varies from nearly level to rolling and some hilly areas of wind-blown sand on the uplands in Cass, Menard, Mason, and other counties are included. The soils vary from light to dark in color. Because of their coarser textures, greater permeability, and lower water-holding capacity, they are generally less productive than the soils in Area R. Drouthiness and wind erosion are major problems on the sandier areas. Drainage is sometimes needed and soil fertility is generally a problem on these soils.

Area T - This association occurs in the unglaciated portion of northwestern Illinois. The topography is strongly rolling to steep. The soils are formed from loess deposits on the narrow ridgetops and near Mississippi river, but rough stony land and outcrops of limestones and shales are found on the steeper slopes. Most of the soils have light-colored surfaces, but some small areas of dark-colored soils are present. The subsoils vary from moderately rapid to slow in permeability depending on the parent rock. Seepage areas on slopes present some drainage problems. Erosion and fertility are serious soil problems on cultivated areas, but much of this area is adapted only for pasture and timber. The tillable land is medium-productive under good management.

Area U - Soils in these areas in northwestern Illinois are formed from relatively shallow loess or Illinoian till deposits over limestone, sandstone, or shale bedrocks. The topography is gently rolling to steep. Dark and light-colored soils with silt loam to loamy sand textures are included in this association. Soil fertility, erosion, and drouthiness are major problems in these areas. Most of the soils are low to medium in productivity. The area in central Winnebago county is the best large agricultural area in this association. It is undulating to rolling in topography and the soils are mostly dark-colored, but frequent areas of shallow bedrock are present. The soils in the small area in northern Winnebago county are quite sandy and droughty.

Area V - These soils occur primarily in LaSalle and adjoining counties. The topography varies from nearly level to gently sloping. The soils have formed from shallow loess deposits over moderately slowly to slowly permeable silty clay loam to silty clay till. They are dark-colored. Where the loess deposits are deepest, the soils resemble those in Area H and where the silty clay loam till is near the surface, they are similar to the soils in Area E. The area in northeastern Woodford county is underlain by silty clay till, and where these deposits are near the surface the soils are similar to the Swygert soils in Area G. The soils in Area V are medium to highly productive.

Area W - This association occurs in west-central Illinois on moderately thick loess deposits over weathered tills. The topography varies from nearly level to steep. The weathered tills and bedrock outcrop on the steeper slopes. Some areas in western and southern Adams county are underlain by sand. The soils are light-colored and have slowly permeable to very slowly permeable subsoils. They are low to very low in productivity. Soil fertility and erosion are major problems in this area. Drainage is also a problem on the nearly level areas and where seepage occurs on some of the slopes.

Area X - This association occurs mainly in the unglaciated section of southern Illinois. The topography is dominantly hilly to steep. On the ridge-tops the soils have light-colored silt loam surfaces and slowly permeable subsoils. Since these subsoils are frequently high in silt and not high in clay, they are referred to as "silt pan" soils. On the steeper slopes rough stony land and rock outcrops are common. Much of this area is best adapted for use as pasture and timber. Fertility, water conservation, and erosion are major problems in this area.

Area Y - These areas are the larger dark-colored, nearly level, alkaline, neutral, or slightly acid bottomlands in Illinois. Some small R and S areas are included. The soils vary in texture from sandy loams to clays. Overflow is a major hazard of cropping in parts of these areas that are not protected by levees. Drainage is a major problem. When drained these soils are generally medium to high in productivity. Where undrained they are frequently suitable only for pasture or timber.

Area Z - These areas are nearly level to undulating bottomlands and terrace soils in southern Illinois. They are dominantly light-colored soils varying in texture from clays to sandy loams. They are acid in reaction and low in productivity. Drainage and soil fertility are major problems in these areas. Some of the sandy soils are droughty.



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